UTILITY OIL BATHS "MW-1115 SERIES"

1. OPERATING AND MAINTENANCE INSTRUCTIONS..... I-100-1 (I-1004-8A)

2. CALIBRATING INSTRUCTIONS FOR BLUE M DUAL SCALE MEMORY RING DIAL SYSTEM.....I-301-13R1

3. BLUE M MAX-SET OVERTEMPERATURE PROTECTION OPERATING INSTRUCTIONS.....I-206-1R1

4. READY READ THERMOMETER.....I-202-4

5. HEAT TRANSFER FLUID DATA SHEET.....I-303-4 (I-1008-4)

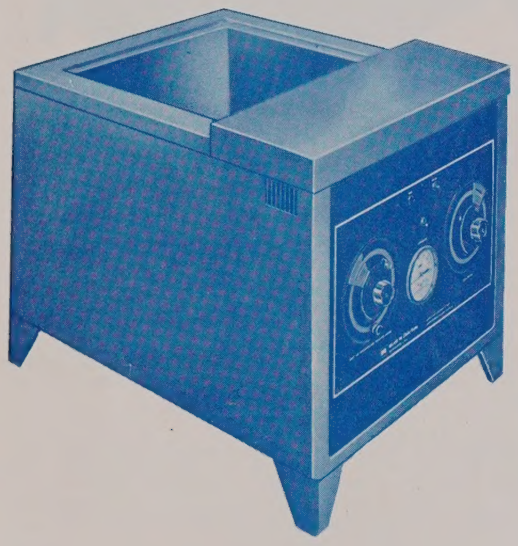
6. LINE CORD NOTICE.....I-303-19

7. WIRING DIAGRAM.....WD-

BLUE M IS IN THE PROCESS OF CHANGING ITS INSTRUCTION NUMBERING SYSTE. THERE MAY BE TWO NUMBERS LISTED FOR A SPECIFIC INSTRUCTION ON THE TABLE OF CONTENTS; FIRST THE NEW NUMBER, FOLLOWED BY THE OLD NUMBER, IN PARENTHESIS. THE INFORMATION CONTAINED IS IDENTICAL, REGARDLESS OF THE NUMBERS ON THE INSTRUCTIONS.

PROPERTY OF DEPT. C-270
METROLOGY LAB.
DO NOT REMOVE
FROM AREA
7-31-79

BLUE M
BLUE M Electric Company
Corporate Headquaters: Blue Island, Illinois 60406



OPERATION and MAINTENANCE MANUAL

BLUE M

Magni Whirl®

PATENTED IN U.S.A. AND CANADA

Constant HIGH Temperature

UTILITY OIL BATHS

IMPORTANT

THIS MANUAL SHOULD BE READ CAREFULLY BEFORE UNIT IS PLACED IN OPERATION.

Models MW-1115A-1, MW-1145A-1,
MW-1125C-1, MW-1155C-1
MW-1135C-1, MW-1165C-1

BLUE M

BLUE M Electric Company

CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406

BLUE M

OPERATION AND MAINTENANCE

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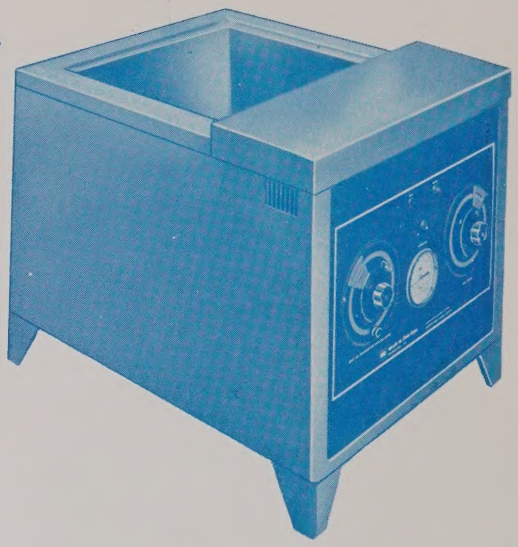

Models MW-1115A-1, MW-1145A-1,
MW-1125C-1, MW-1155C-1
MW-1135C-1, MW-1165C-1

I. INSTALLATION:

All standard Blue M Electric Company Constant High Temperature Oil Baths are shipped electrically complete. Positioning unit and connecting proper electrical service are the only requirements for placing unit into operation.

A. This bath is expected to, and is capable of automatically controlling temperature within very close tolerances. In order to utilize this bath at its maximum capabilities, some care in the choice of location will have to be exercised. Do not locate in an area where unit will be subjected to extremely wide ambient temperature variations, i.e., near outside entrances, windows, building heating and/or air conditioning vents.

B. Connect unit to source of power. (Voltage and frequency are specified on nameplate.)

C. BE SURE TO GROUND UNIT. Blue M units supplied with a line cord have a three wire cord. Unit is automatically grounded when plugged in.

D. IMPORTANT! Fill bath until heating elements are covered with at least two (2) inches of fluid. If this precaution is not observed, heating elements will be ruined.

E. Fused protection should not exceed 125% of unit rating.

F. Blue M Electric Company recommends the use of *UCON fluid as a heat transfer medium because it is (1) water soluble, (2) will not carbonize, and (3) will not cause metal parts to corrode.

* Registered Trademark U. C. C. Co.

II. OPERATING INSTRUCTIONS:

A. Be sure installation instructions have been noted and complied with.

B. Turn on main switch. Amber pilot light indicates that the heating elements are energized. White pilot light indicates operation of the Magni-Whirl agitator plate.

C. Set desired temperature with main control. Refer to separate instruction for calibration.

D. Set Magni-Whirl to desired pulse frequency and pulse duration. See section IV for complete operation of Magni-Whirl.

III. TEMPERATURE CONTROLLER:

The temperature control used on Magni-Whirl Oil Baths is the "Microtrol." It is an indirect acting thermostat which works on the principal of thermal sensitivity of certain fluids. The Microtrol consists of a sensing bulb, capillary tube, diaphragm and a sensitive microswitch. As temperature of sensing bulb is raised, fluid in the system expands, forcing the diaphragm outward. Motion of the diaphragm is utilized to open or close the contacts inside the microswitch. The microswitch contacts in turn energize and de-energize the relay coil which in turn controls the amount of power delivered to the heating elements.

IV. MAGNI-WHIRL AGITATION SYSTEM:

This is a two-fold system that consists of a controller and a transducer. The controller is a self-contained D. C. power supply, RC timing network, unijunction transistor trigger and silicon controlled rectifier (SCR) current controller.

This self-contained module is mated to the transducer and A. C. power by a three-prong plug. The transducer is an electromagnet mounted beneath the bath and a counter-balanced pump plate located in the bath: the pump plate is made of a magnetic stainless steel: so as the electromagnet is energized and de-energized, the pump plate oscillates. Through the use of solid-state devices, the system has a minimum of moving parts which provides the optimum in trouble-free life.

The knobs labeled "PULSE FREQUENCY" and "PULSE DURATION" refer respectively to pump plate frequency and duration, and may be adjusted to the desired agitation.

Protruding from the front panel is a RED button labeled "PUSH TO RESET AGITATOR;" this is a KLIXON thermostat. If the pump plate does not release, the KLIXON will pop . . . wait approximately one minute before resetting. If the KLIXON trips repeatedly, the current limiting resistor may be too close to the thermostat. Remove the eight screws holding top cover and front panel in place. Heating elements and control compartment cover are removable as one assembly. The current limiting resistor is a flat brown type mounted on the thermostat. Minimum spacing to thermostat should be 1/16 inch; maximum spacing should be 1/8 inch. Readjust resistor and operate bath to check performance.

WARNING! ALWAYS DISCONNECT POWER TO BATH BEFORE CONTROL COMPARTMENT IS OPENED.

V. CLEANING OF BATH:

Bath is constructed of type 304 stainless steel, 18% chromium and 8% nickel. However, if bath is used frequently, it should be drained and cleaned at least once a month.

1. Disconnect electrical power from bath.
2. Drain oil from bath.
3. Remove four screws holding top cover in place. The heating elements and control compartment cover are removable as one assembly.
4. Lift cover approximately six (6) inches and then tilt entire assembly back.
5. Remove Magni-Whirl agitator plate.
6. Use a damp cloth wrung out in a hot mild soapy solution.
7. Take a clean cloth and dip in clear hot water. Wring out practically dry and wipe off soapy solution.
8. Dry with a clean soft cloth.
9. Severe deposits can be removed by any of the following methods.
   a. A high quality scouring compound that will not mar the surface . . . Bon Ami or equal.
   b. Use one of the commercially available stainless steel cleaning compounds.
   c. Tartaric acid may also be used.
10. Grease or oils may be removed by cleaning with a vapor degreaser or other solvents such as naptha, benzine, thinner, etc. "Tide" or equal is also recommended.

IMPORTANT

Whenever replacement parts are ordered or factory is contacted for service, always refer to Model No., Serial No., and Voltage.

WARRANTY AND GUARANTEE OF COMPONENTS FOR BLUE M MAGNI-WHIRL OIL AND WATER BATHS ALL MODELS

DESCRIPTION OF COMPONENT	TYPE OF WARRANTY OR GUARANTEE TIME FROM DATE OF SHIPMENT		
	60 DAYS	1 YEAR	OVER 1 YEAR
Element-Sheathed Tubular Heater	B	C	A
Controls—Blue M Automatic Microtrol	B	C	A
Control—Thryraton Electronic Relay Assembly	B	A	A
Indicator—Thermometers	B	C	A
Electromagnet	B	C	A
Water Control—Drain Valves, Cooling Coils, etc.	B	C	A
Pumps	D	D	A
Switches	B	C	A
Compressor Refrigeration Components	D	D	A
Relay and Contactors	B	A	A
Power Supply Removable	C	C	A
Solid State Components/Capacitors/Resistors	B	C	A
Miscellaneous Electrical Wiring Components—Pilot Lights, Plugs, etc.	B	C	A
Unit Proper	C	C	A

A—Part not Guaranteed or Guarantee has expired.

B—New replacement part shipped immediately. Customer will be invoiced for part. Full credit issued upon receipt and inspection of defective part. All parts subject to our inspection for abuse, etc. Warranty void should our inspection indicate abuse, misuse, over-heating, etc. Factory absorbs freight both ways with shipments made in regular manner. Air shipment charges will be made collect.

C—Defective part returned to our factory, transportation prepaid. If found defective, we will repair or replace at no charge. Repaired or replaced part(s) returned collect in accordance with customers instructions or method, which in our judgment, will be best. Warranty void should our inspection indicate abuse, misuse, over-heating, etc.

D—This item covered by separate manufacturer's warranty. Contact Blue M Electric Company for name and location of nearest service representative in your area.

Note 1. Guarantees do not apply to non-standard accessory items ordered with unit.

Note 2. Guarantees do not apply when our standard parts are substituted with parts from other suppliers with whom Blue M Electric does not have a working service agreement.

Note 3. Collect shipments are not accepted at factory without written or verbal permission from authorized personnel. If done so, we reserve the right to invoice for these collect charges.

Note 4. This warranty or guarantee is not transferable.

Note 5. To allow for installation of units all time limits are subject to a 30 day maximum extension period.

Note 6. Claim for damages or shortages must be made within 10 days after receipt of unit.

Note 7. Blue M Electric Company assumes no responsibility when alterations are made without consent.

Note 8. Blue M Electric Company assumes no responsibility for recharging refrigeration units.

BLUE M

BLUE M Electric Company

CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406
138th & CHATHAM (312) 385-9000 — TWX: 910-689-3398

MANUFACTURERS AND ORIGINAL DESIGNERS OF CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

OPERATION AND CALIBRATION OF BLUE M MEMORY RING® DIAL SYSTEM

Blue M's patented Memory Ring Dial System is supplied with many Blue M temperature control systems. The Memory Ring allows accurate and repeatable temperature settings throughout range of unit. All dials are factory calibrated to commercially acceptable standards.

NOTE: This is a dual scale dial. Care must be taken to read the correct scale when selecting operating temperature.

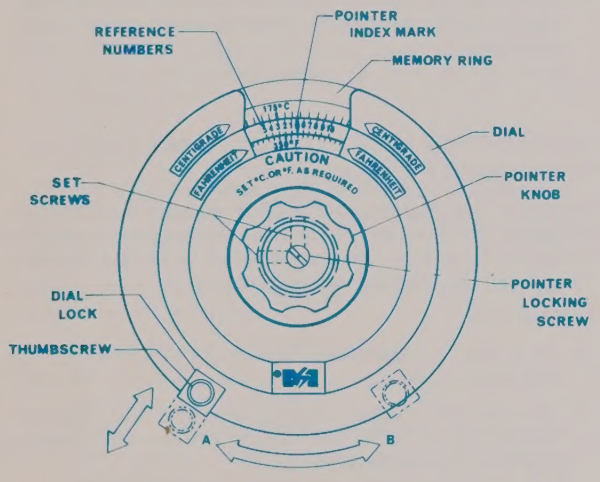

Figure 1

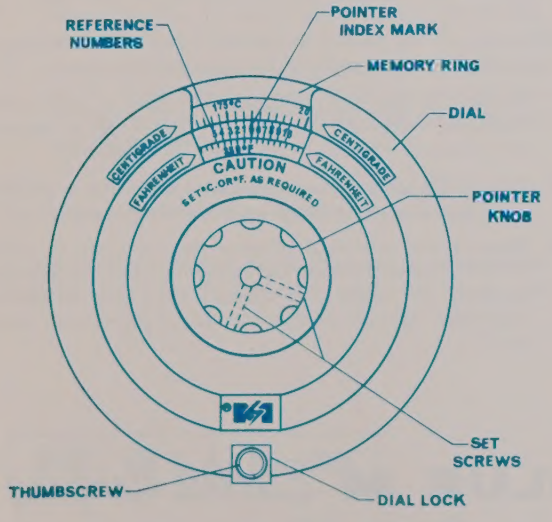

Figure 2

USING THE MEMORY RING AND REFERENCE NUMBERS:

1. Turn unit ON according to basic unit instructions.
2. Unlock dial (refer to Dial Lock Section), and rotate knob until pointer index mark is aligned with desired temperature, +175°C. in this case. Refer to figures 1 and 2.
3. Allow unit to stabilize (approximately 1 hour without temperature change, as measured by an independent temperature indicator of known accuracy).
4. If temperature measured within chamber does not agree with dial setting, rotate pointer knob slightly in desired direction to bring unit to required temperature.

NOTE: Rotate knob CLOCKWISE to INCREASE temperature; rotate COUNTERCLOCKWISE to DECREASE temperature.

5. Allow unit to stabilize (approximately 15 minutes).
6. Repeat steps 4 and 5 until unit stabilizes at exactly +175°C.
7. Note which reference number is lined up with +175°C. Assume that the number 3 lines up in this example. Refer to figure 3.

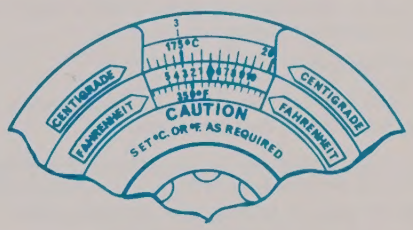

Figure 3

8. Using a pencil or ball-point pen, make a small mark on Memory Ring above +175° C, mark, and write correction number "3" above mark.
9. In future, when control is turned to +175°C., the correction number 3 will appear in pointer window. It will coincide with number 3 on dial pointer and indicate proper setting for +175°C.
10. All temperatures may be calibrated in the same manner. The dial may be calibrated in normal use by marking a correction number when proper temperature is reached.

NOTE: If any desired temperature setting cannot be accommodated in pointer window, recalibration of control dial may be required.

DIAL LOCKS: There are two dial locks utilized on Blue M temperature control units. One is fixed below the center of dial, figure 2, and one has a two position dial lock as shown in figure 1. The movable lock allows 370° rotation of dial.

To lock dial with two position lock, swing it as far to the left or right as possible and push it up towards center of dial until dial is engaged. Tighten thumbscrew to hold dial in position. When thumbscrew is released, lock will fall away from dial.

To engage fixed lock as shown in figure 2, turn thumbscrew clockwise to lock dial; counterclockwise to release it.

RECALIBRATING CONTROL DIALS

Recalibration should only be necessary after replacing a component in control systems, after extended heavy usage, or if desired temperature cannot be accommodated within pointer window. ALWAYS use an independent temperature indicator of known accuracy when recalibrating dial.

To recalibrate control unit with movable lock, (also identifiable by screw in the middle of the pointer knob), proceed as follows:

1. With unit operating, set pointer index mark to some mid-scale temperature.
2. Lock dial securely.
3. Allow unit to stabilize (approximately 1 hour without temperature change).
4. Loosen the pointer locking screw in center of knob, and loosen two knob set screws (see figure 1). Loosen dial lock. Dial should now rotate independently of the knob and shaft. Note: it may be necessary to pull knob forward slightly to free dial.
5. Turn dial to align pointer index mark with actual temperature within chamber.
6. Tighten dial lock.
7. While holding pointer knob firmly, tighten pointer locking screw, then two set screws.
8. Allow unit to operate 15 minutes, and re-check temperature to be sure that setting was not disturbed during calibration. If setting was changed, allow unit to stabilize and repeat entire procedure.
9. Check reference marks on Memory Ring for accuracy. If necessary, remove marks and follow procedure outlined under "Using the Memory Ring and Reference Numbers."

To recalibrate unit with fixed lock (also identifiable by lack of a screw in center of pointer knob), proceed as follows:

1. With unit operating, set pointer index mark to some mid-scale temperature, and lock dial.
2. Allow unit to stabilize (approximately 1 hour without temperature change.)
3. Loosen set screws sufficiently to allow knob and dial to rotate independently of shaft.
4. Loosen dial lock.
5. Rotate dial on shaft until the pointer index mark is aligned with actual temperature within chamber.
6. Tighten dial lock.
7. Tighten set screws in pointer knob.
8. Allow the unit to operate 15 minutes and re-check temperature to be sure that setting was not disturbed during calibration. If setting was changed, allow unit to stabilize and repeat entire procedure.
9. Check reference marks on Memory Ring for accuracy. If necessary, remove marks and follow procedure outlined under "Using the Memory Ring and Reference Numbers".

OPERATION OF BLUE M OTP SYSTEMS WITH MEMORY RING DIAL

Operation and Maintenance of Blue M's Overtemperature Protection Systems (OTP) are basically the same as for the temperature control systems supplied with the Memory Ring Dial, with the following differences:

OPERATION

1. With the unit operating, loosen the dial lock (see figure 1).
2. Set the OTP control index pointer to a point approximately 5° to 10°C. (10° to 20°F.) above the desired operating temperature.
3. If "Control Failure" light glows, press reset button.
4. Unit will now operate, with OTP shutting down the unit in the event of an over temperature condition.

Calibration of the unit is the same as that of the temperature control systems, with the following differences:

1. Loosen the dial lock and turn OTP control knob fully clockwise; operate unit until it stabilizes at desired temperature, +175°C., in this case. (see figure 1).
2. Turn OTP control down (counterclockwise) until the OTP trips and shuts down unit, sounding buzzer.
3. Observe the reference number that is lined up with +175°C., and proceed by following the instructions outlined in "Using the Memory Ring and Reference Numbers" section of this manual, starting with number 7.

BLUE M

BLUE M Electric Company

CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406

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MANUFACTURERS AND ORIGINAL DESIGNERS OF CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

Printed in U.S.A.

BLUE M

INSTRUCTION NO. I-206-1R1

BLUE M MAX-SET

OVERTEMPERATURE PROTECTION SYSTEM (OTP)

I. INTRODUCTION

System consists of a temperature sensing thermostat, external time delay and reset circuit. Design of circuit allows unit to re-start automatically if overtemperature condition is momentary (ie., power surge to unit); in case of interrupted power to unit, manual reset is not required.

II. CALIBRATION

OTP is supplied with dial calibrated in reference numbers of degrees (F or C). Each reference number represents approximately 10°C. (20°F.). Generally, OTP should be set 10°C. (one reference number) higher than desired operating temperature. To set OTP, proceed as follows:

A. Turn OTP control fully clockwise.
B. Turn unit ON, set to desired operating temperature and allow unit to stabilize.
C. Slowly rotate OTP control counterclockwise until control trips shutting unit OFF. Observe temperature or reference number at which OTP trips.
D. On units with reference numbers, rotate control one reference number higher than number obtained in step C, above. Press RESET BUTTON; unit should now operate normally.
E. On units calibrated in degrees, set OTP control 10°C. higher than temperature obtained in step C, above. Press RESET BUTTON; unit should operate normally.

More precise calibration may be achieved by following directions in Memory Ring Instructions, enclosed.

If temperature within work chamber rises to OTP setpoint, device will trip, and shut unit down. As unit cools below OTP setpoint, Max-Set circuitry will restart unit automatically. This cycle should repeat three times, if overtemperature condition is not rectified. If unit continues to cycle on and off, resistor mounted behind RESET BUTTON (thermally activated time delay) is positioned too far from Re-Set switch; if unit trips and shuts unit down completely without cycling, resistor is too close to re-set switch. Average spacing between resistor and re-set switch is approximately 3/16". OTP must be manually reset after unit completely shuts off.

NOTE: Cause of overtemperature condition should be corrected before unit is reset.

III. MAINTAINENCE

A. Periodically, turn temperature control above OTP setpoint to verify proper operation of OTP system.
B. If OTP should malfunction, check OTP thermostat; contacts should be closed when OTP control is set above unit operating temperature; open when control is set below operating temperature.

IV. PROTECTION OF LIVE ELECTRICAL TEST LOADS

When testing live electrical loads, damage to load may occur if load power supply is not interlocked with OTP. In event of overtemperature condition, power to unit will be shut off; however, heat generated by test load may be sufficient to cause damage to load and unit. It is suggested that test load power supply be interlocked with OTP to insure power to load will be cut when OTP trips. Suggested practice is to connect safety interlock coil in parallel with OTP contactor coil.

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MANUFACTURERS AND ORIGINAL DESIGNERS OF CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

CALIBRATING INSTRUCTIONS FOR BLUE M READY-READ TEMPERATURE INDICATOR

The Ready-Read Temperature Indicator is actuated by a liquid-filled thermal system employing a high torque bourdon spiral. There are no gears, hair springs, pinions or multiplying mechanisms to detract from its ruggedness and reliability. The dial arc is a full 270° on a 3" diameter scale and indicator accuracy is ± 2%.

The Ready-Read Thermometer eliminates the irritation and expense of broken glass thermometers. In our judgement, it is more accurate than most small dial thermometers and more convenient than pyrometers with thermocouples. Temperature graduations are easily read and are in both Centigrade and Fahrenheit.

The following instructions explain the use and calibration of Ready-Read Thermometers. In addition, pertinent background information on the liquid-filled thermal system is given.

GENERAL INFORMATION

BASIC READY-READ THERMAL SYSTEM

The basic Ready-Read thermal system is shown in Figure 1. The entire system is filled with a liquid that expands with an increase in temperature. The sensing bulb is a fine bore tubing immersed in the work chamber to measure the temperature. The capillary is also a fine bore tubing that merely "transmits" pressure changes from the sensing bulb to the "Bourdon tube". The Bourdon tube converts pressure changes into rotary motion, thus providing indication on the calibrated scale.

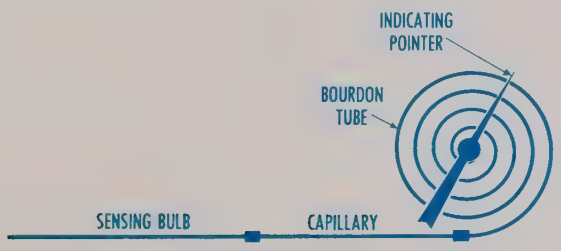


FIG. 1

AMBIENT TEMPERATURE INDICATION AND COMPENSATION

DO NOT ADJUST AMBIENT INDICATION WHEN UNIT IS FIRST RECEIVED AND INSTALLED REGARDLESS OF POINTER INDICATION.

The Ready-Read Temperature Indicator is installed on the unit and then calibrated after the unit has operated for at least one (1) hour. This procedure compensates for ambient rise within the control compartment due to normal heating of electrical components (motors, coils, saturable reactors, etc.). Since the Ready-Read is calibrated with the capillary exposed to relatively high control compartment temperatures, ambient indication will be lower than true ambient until the unit has operated for at least one (1) hour.

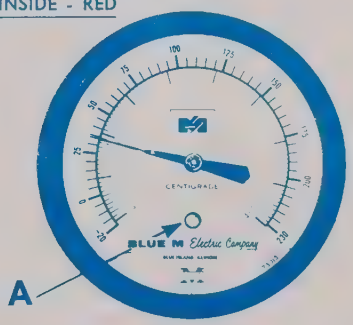
NOTE: Because the Ready-Read Temperature Indicator is not a "total immersion" temperature measuring device, it cannot be used to indicate varying "room" temperatures. Only the sensing bulb must be immersed in the medium to be measured.

The Ready-Read Temperature Indicator automatically compensates for ambient temperature variations experienced at the "case". Compensation is accomplished by a built-in bimetal opposing the rotation of the Bourdon tube.

CALIBRATION

Attach thermocouple of calibrating instrument directly to the Ready-Read sensing bulb. Turn unit "on" and allow to operate for one (1) hour at its lowest controllable temperature. NOTE: For units having sub-ambient temperature capabilities, use ambient for the zero adjustment.

CENTIGRADE - OUTSIDE - BLACK
FAHRENHEIT - INSIDE - RED



ZERO ADJUSTMENT

1. Remove "Bezel" and glass cover from Ready-Read Temperature Indicator. Removal made by prying outward with a small screwdriver, etc., around the perimeter of the chrome plated ring.
2. Rotate adjusting screw "A" until the indicated temperature corresponds to the temperature shown by the calibrating instrument.
3. The zero adjustment is now complete.

SPAN ADJUSTMENT

1. Set unit for an operating temperature near maximum. (If unit maximum temperature is +343°C., set for +300°C. If maximum is +200°C., set for +200°C., etc.)

NOTE: For units having sub-ambient temperature capabilities, the span adjustment may be made on either side of ambient temperature. If greater accuracy is desired at low temperature, set unit for an operating temperature near its minimum. (If unit minimum temperature is —100°F., set for —100°F. If minimum is —40°F., set for—40°F., etc.)

2. Allow unit to operate at this high temperature for one (1) hour.

3. If the temperature shown on the Ready-Read Temperature Indicator is lower than the temperature shown on the calibrating instrument, the "span" is too short.
Correct by pushing sensing bulb farther into the work chamber.

4. If the temperature shown on the Ready-Read Temperature Indicator is higher than the temperature shown on the calibrating instrument, the "span" is too long.

   Correct by pulling the sensing bulb farther out of the work chamber.

   Adjust the sensing bulb, in or out as required, approximately $\frac{1}{2}$". Allow 10 to 15 minutes for the Ready-Read Temperature Indicator to stabilize. Continue this procedure until the Ready-Read indicates the correct temperature in accordance with calibrating instrument.

The span is now properly adjusted. Reseal into position with a high temperature material such as General Electric RTV Sealant.

NOTE: Changing the immersion depth has a marked effect on temperature indication at the high end of the scale. However, at the low end the effect is negligible. Referring to Figure 2, this is easy to understand.

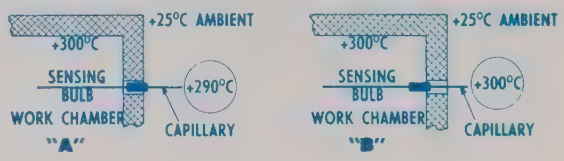


FIG. 2

At a temperature of +200°C. or +300°C., additional immersion exposes more of the sensing bulb to this high temperature. Indication therefore increases. At a low temperature (+25°C.), additional immersion accomplishes nothing, since the chamber's temperature and ambient temperature are the same.

BLUE M

BLUE M Electric Company

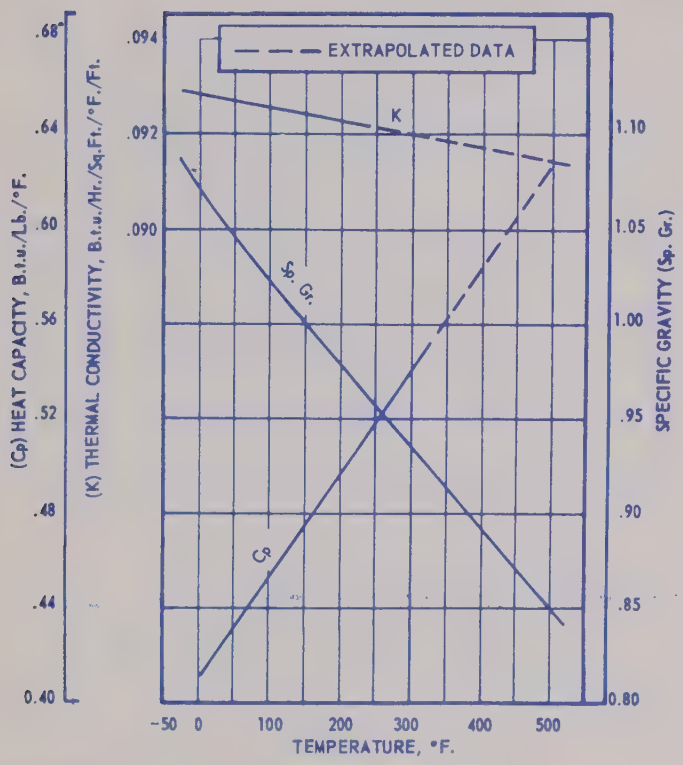
CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406

MANUFACTURERS AND ORIGINAL DESIGNERS OF CONSTANT TEMPERATURE CONTROLLED EQUIPMENT

BLUE M *UCON HEAT TRANSFER FLUIDS

- SOLUBLE IN COLD WATER (HIGH TEMPERATURE ONLY)
- RESISTANT TO SLUDGING AND COKING
- TWO TYPES
- FLASH POINTS:
  + 260°C. (+500°F.)
  or + 163°C. (+325°F.)

RECOMMENDED FOR OUR MAGNI-WHIRL® OIL BATHS



Physical properties of UCON heat transfer fluid HTF-100.

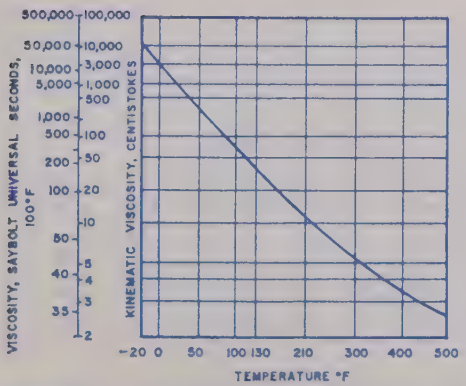
UCON fluids may be described chemically as the ether of a polyalkylene oxide (polyglycol) that contains an aromatic amine as an antioxidant. The polyglycol contains no chlorine, phosphorus or aromatic constitutents. UCON fluids exhibit a very low order of toxicity. In tests of oral intake, skin irritation, skin absorption, eye irritation and inhalation, these fluids are quite bland. However, as with all organic materials, adequate ventilation is recommended and should be provided whenever the fluids come in contact with air at elevated temperatures. They differ in chemical nature and in performance from natural oils and from other synthetic heat-transfer liquids. Some of their characteristics, which result in excellent and economical performance, are summarized as follows:

1. Unusually low toxicity.
2. Safe to handle.
3. Electric immersion heaters and other heat transfer surfaces stay clean; give long, continuous operation at high efficiency.

Two types—for specific bath and flash point ranges.

Cat. No. HTF-100, +260°C. flash point, +316°C. fire point. Use for MW-1145, 1155 and 1165 Series.

Cat. No. HTF-101, +163°C. flash point, +190°C. fire point. Use for MW-1115, 1125, and 1135 Series.



Viscosity vs. temperature for UCON fluid HTF-100.

PHYSICAL PROPERTIES	HIGH TEMPERATURE No. HTF-100		LOW TEMPERATURE No. HTF-101	
Viscosity	S.U.S.	Centistokes	S.U.S.	Centistokes
210°F.	64.6	11.5	36.1	2.95
100°F.	280.0	60.6	70.0	13.10
77°F.	490.0	100.0	85.0	18.0
Viscosity Index	150		78	
Flash Point (Open Cup), °F.	500°F.		325°F.	
Fire Point (Open Cup), °F.	600°F.		375°F.	
Coefficient of Expansion, per 0°F. (+68°F.)	0.00042		0.00045	
Density, lb./gal., +60°F.	8.69		8.0	

*Registered Trade Mark U.C.C. Co.

BLUE M
BLUE M Electric Company
CORPORATE HEADQUARTERS: BLUE ISLAND, ILLINOIS 60406
Phones: (312) INterocean 8-7755 - 7756 FUlton 5-9000 TWX: 910-689-3398

FOR USE WITH WD-945

BLUE M

BLUE M Electric Company

Corporate Headquarters, BLUE ISLAND, ILLINOIS 60406

DRWN. GM 12-12-77

CHKD. WS 12/20/77

APPRD. WS 12/20/77

MODEL NUMBER: MW-1155C-1(Y)

VOLTAGE: 240V/1PH/60HZ (50 HZ)

MAX. TEMPERATURE: 260°C. (500°F.)

MAX. WATTS: 4.3 KW

INTERIOR DIMENSIONS: 18L X 18W X 15D

PWD-52E-945-1

Page of

*PARTS NOT SHOWN

**OPTIONAL ACCESSORIES

Parts shipped F. O. B. Blue Island, Illinois. — When ordering parts, give Model No., Serial No., Voltage and Part No.

ITEM	DESCRIPTION	PART NUMBERS	REQ'D.
1	MAIN SWITCH	E16A-5	1
2	TEMPERATURE CONTROL	C03A-3-8	1
*3	CONTROL BELLOWS ASSEMBLY	C11A-3	1
*4	REPLACEMENT MICROSWITCH	E16H-7	1
5	OVERTEMPERATURE PROTECTION CONTROL	C08A-4-1	1
6	RELAY - MERCURY (R1)	E02B-1-1	1
7	RELAY COIL (C1)	SUPPLIED W/RELAY	
8	HEATING ELEMENT	E05A-11	1
9	HEATER PILOT LIGHT AMBER	E06B-1	1
10	MAGNI-WHIRL POWER SUPPLY	E15A-1-2	1
11	MAGNI-WHIRL SOCKET	E19B-7	1
12	D C ELECTROMAGNET	E08-12	1
13	AGITATION PILOT LIGHT WHITE	E06B-3	1
*14	DIAL THERMOMETER	C01A-5	1
15	FUSE	E04A-30	2
16	TRANSFORMER 240V/120V 35 VA	E17B-1-6	1
17			
18			
19			
*20	WIRE RACK DIFFUSER	M04-A126	1
*21	PUMP PLATE WITH LEAF SPRINGS	PP-104	1
**22	GABLE COVER	M21-A4	1
23			
**24	HEAT TRANSFER FLUID	HTF-100	5 GAL.
25			
26			
27			
28			
29			
30			
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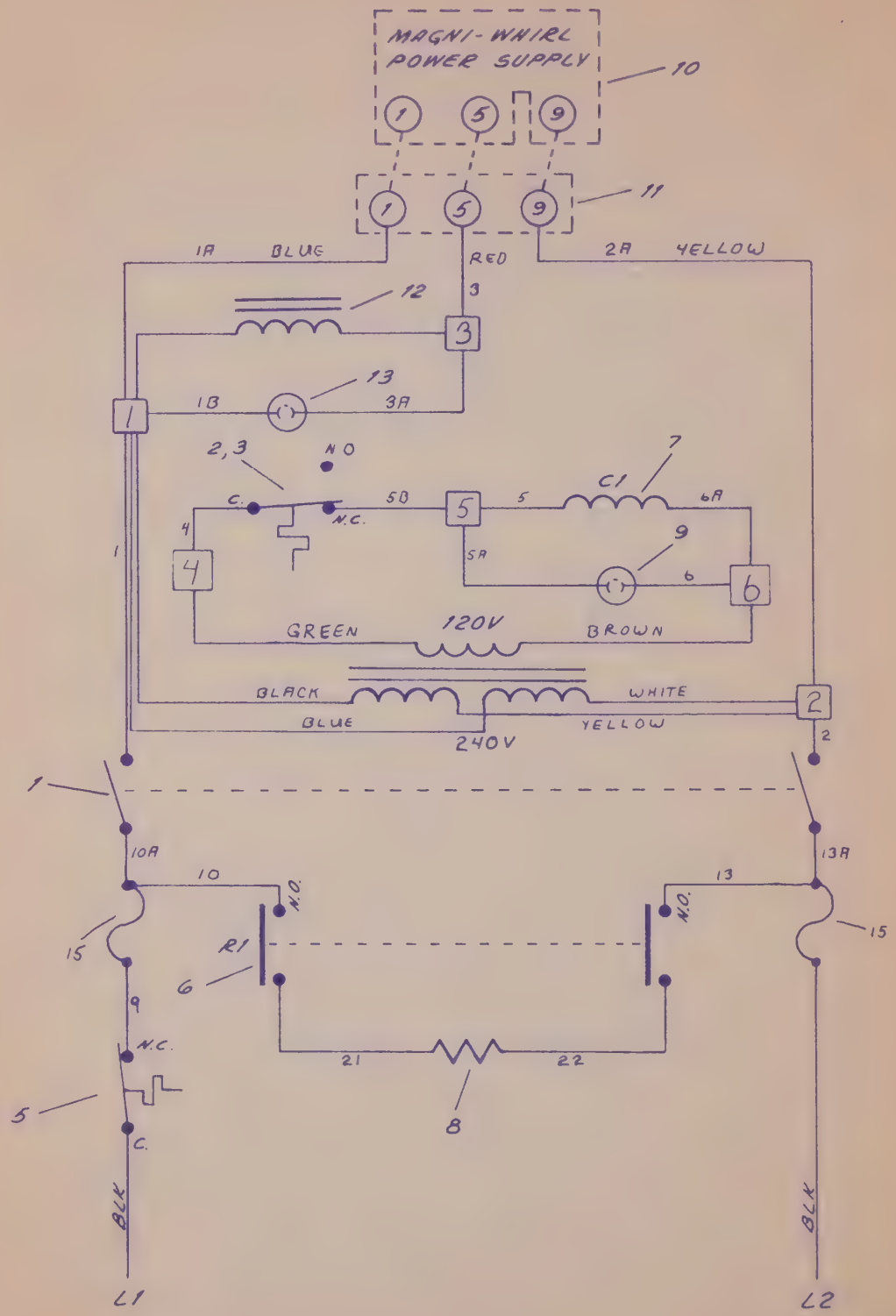
49			
50	240V - 20 AMPS		


MAGNI-WHIRL
POWER SUPPLY
10
1
5
9
11
1A
BLUE
RED
2A
YELLOW
12
3
13
1B
3A
2,3
NO
C.
N.C.
5B
5
5A
C1
7
6A
9
4
6
GREEN
120V
BROWN
BLACK
WHITE
BLUE
YELLOW
240V
2
10A
10
N.O.
15
R1
6
13A
13
21
22
8
N.C.
C.
BLK
L1
L2

LET.	REVISIONS

BLUE M

BLUE M Electric Company
BLUE ISLAND, ILLINOIS 60406

PART NAME: WIRING DIAGRAM

USED ON: MW-1125C-1 MW-1135C-1 MW-1155C-1

SCALE	DATE	DRAWING NO.	REV.
NONE	4-21-78	WD-945	

DRAWN: JG

CHECKED: WS

APP WS

60610

MP MASTER
MA34370